

Introduction to DS0 Testing QUICK SHEETS

The 440B supports the installation and maintenance of a wide range of DS0 services and equipment, whether voice or DS0A/B data. It also provides comprehensive digital switch/PBX test capabilities including sending and capturing telephone numbers as well as wink generation and wink timing.

The 440B provides unique in-service error monitoring at DS0A/B rates, as well as stress testing (BERT with patterns). These tests require setting the Receiver Set-Up MODE for the specific type and rate (or preferably, LOCKED TO XMTR) and setting the test up for the corresponding transmitter. When set up to test DS0A/B DATA the unit will capture all errors including DS0B Frame Bit, DS0A Majority Vote errors, Loss of Frame, Loss of Secondary channel as well as all DS1 errors.

Since Receivers 1 and 2 are independent, both can be used for DS0 testing; however, only RCVR2 can measure wink timing. Transmitters 1 and 2 are also independent, and nearly identical with the exception of Wink and Telephone numbers; only Transmitter 1 can be used to generate winks and telephone numbers.

Performing DS0A/B Data error measurements (with stress patterns like 511, the 2047) usually requires setting Receiver SET-UP mode to LOCKED TO XMTR and setting up DS0 test in the transmitter. (NOTE: The receivers can be independently set-up for DS0B 2.4Kb/s testing, for example, but locking to XMTR is easier since the receiver will automatically track with Rate and sub-channel changes.) This Set-Up will provide AUTO-pattern SYNC on the SUMMARY screen, and LED indication of SYNC/Bit Error in the receiver section. Using the transmitters for DS0 testing requires first setting transmitter SET-UP mode to CHANNELIZED.

Because the 440B provides both measurement and transmit of DS0 channel parameters, the Quick Sheets are divided into two corresponding parts.

Part I. Performing DS0 Measurements

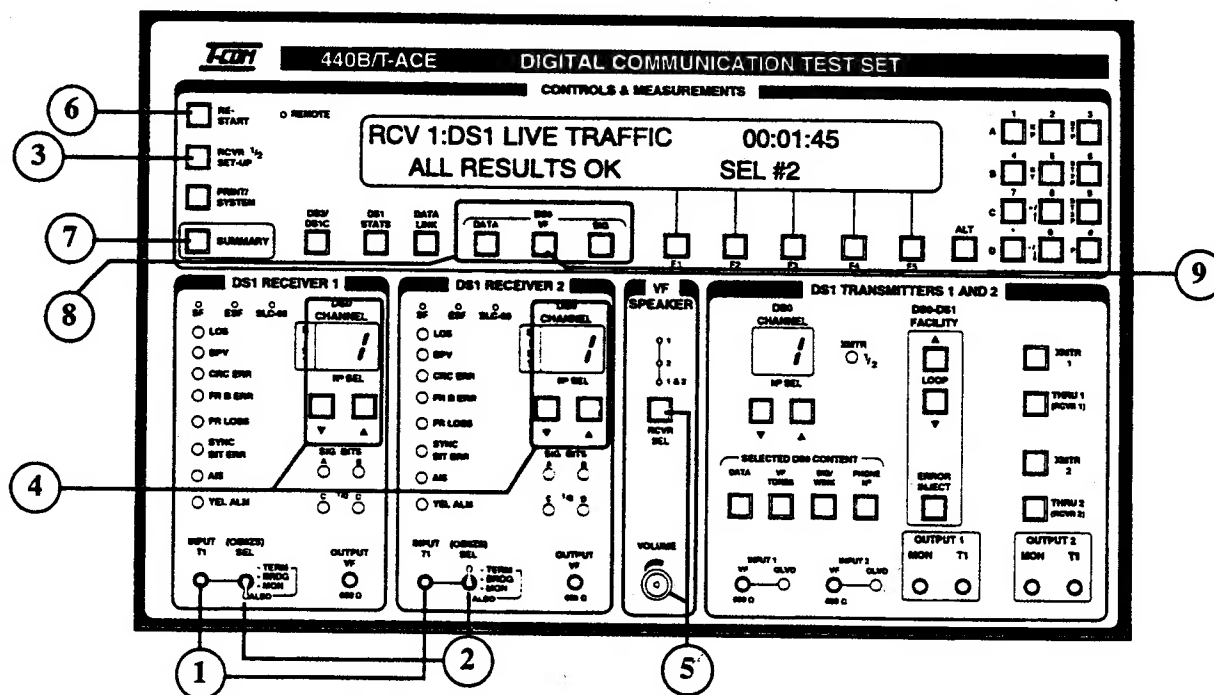
Set Up

1. Patch from the 440B Receiver Input T1 jack to the DSX Monitor Jack.
2. Verify that the Input selection toggle switch (labeled SEL) is set appropriately. Incorrect settings may create BPV + Frame Loss LED indication.
3. **NOTE:** If DS0 Data testing (BERT/turn-up testing using stress patterns) is desired, it is necessary that RCVR SET-UP mode be either LOCKED TO XMTR or in a DS0 DATA mode. (See *Receiver Set-Up Quick Sheet*.)
4. Select desired DS0 Channel with keys (labeled with up-down arrows) in receiver being used (for example Channel 1 in Receiver 1).
5. Adjust speaker volume control, and use selection switch (labeled RCVR SEL) to listen to the selected DS0 channel for Receiver 1, Receiver 2 or both 1 & 2.

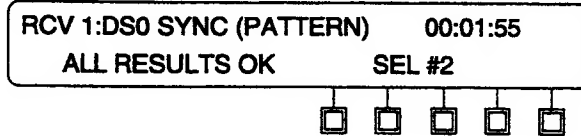
Operation

6. Press the green RESTART key to clear all counters and flashing HISTORY indications.
7. Press the SUMMARY key to display the status of receiver(s) being monitored:

RCV 1:DS1 LIVE TRAFFIC 00:01:45
ALL RESULTS OK SEL #2



NOTE: If testing DS0 DATA, the SUMMARY screen should display DS0 SYNC or Live Traffic similar to the example below. If it does not, change Receiver Set-Up mode to LOCKED TO XMTR (and set XMTR for appropriate MODE). (VF and Signaling measurements do not require a specific RCVR Set-Up.)

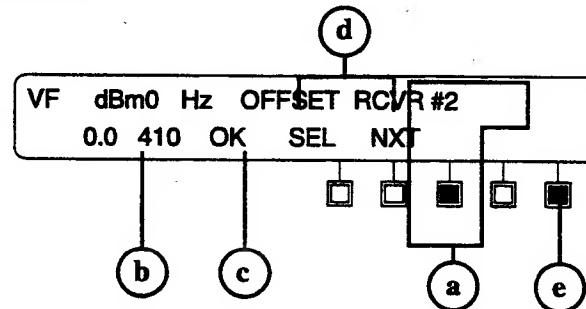


8. Use the DATA, VF, and SIGNALING keys to display DS0 channel measurements. Steps 9-39 show individual screens for VF, DATA, and SIG keys.

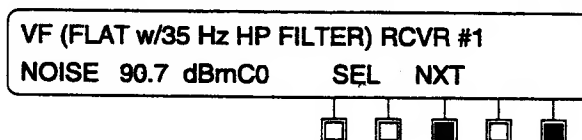
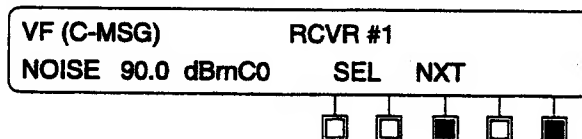
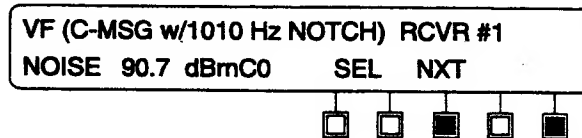
VF Tests

To Measure Level, Frequency, DC Offset, and Noise

9. Press the VF key (see picture for step 8.) to display the first VF screen below. If this screen does not match, press the VF key a second time.



- a) Use SEL softkey (F3) to display results for the DS0 channel in Receiver #1 or Receiver #2. (The screen above is displaying RCVR #1 DS0 results.)
- b) Level is 0.0 dBm0
- c) Frequency is 410 Hz
- d) OK means no DC offset is present (>12 units appears if DC offset exists)
- e) Use NXT softkey (F5) to scroll through the following three Noise screens. After scrolling through the three noise screens, the first (above) VF screen will return.



Signaling Analysis

(Telephone No requires Opt 06)
(Trunk scan requires Opt 07)

NOTES:

The 440B can display signaling bit status simultaneously for all 24 channels in both directions. When equipped with Option 06, it can capture telephone numbers (in MF, DTMF, Dial Pulse, or Cut-Thru modes) and measure winks. Since the unit provides dual DS1/DS0 receivers, it is important to verify which receiver's DS0 channel is chosen when capturing phone numbers and winks.

When equipped with Option 07, the 440B/T-ACE has the capability of scanning any number (from 1 to 24) of DS0 channels within a two-way DS1 trunk circuit for the purpose of capturing and viewing call details and downloading reports to a laptop computer or printer for analysis. The call detail reports can include:

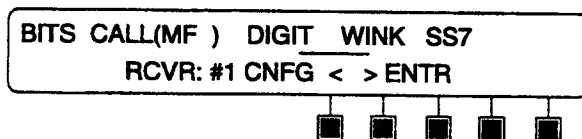
- Direction, time, and channel for call origination
- Wink interval and delay
- MF/DTMF/DP telephone numbers
- Direction, time, and channel for call termination
- If answer was received, direction and release time

These reports can be used to analyze false (or early) disconnects, unusual signaling conditions, and toll fraud on two-way E & M Feature Group D trunks.

Since a variety of signaling supervision rules exist, a CNFG (configuration) softkey in the digit capture screen permits customized settings. An EDIT softkey in the call capture menu provides these and some additional customized settings. (Refer to Appendix 5 for details.)

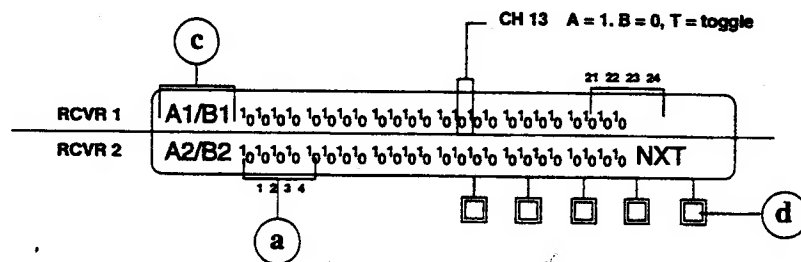
To display signaling status on all 24 channels:

10. Depress DS0 SIG key to display main signaling menu:



Signaling Bit Display

11. Use the < and > softkeys (F3 and F4) to move the underline to BITs and depress ENTR softkey (F5) to select A & B signaling bits display:



- a) Bits are grouped by channels 1-4, 5-9, etc.
- b) Each state will match the individual LED state displayed in the receiver DS0 channel section
- c) A1/B1 row means A and B signaling bits for RCVR 1
- d) If ESF is being monitored, a variety of A/B/C/D bit combinations can be displayed by scrolling with NXT
- e) T (Toggle) is used for 9-state SLC-96 signaling

When the DS1 has SF frame type, the signaling bit display matches the screen above, assuming two DS1 circuits are being monitored. When only one DS1 is being monitored, Frame Loss will be displayed for the second unused receiver.

When ESF framing is present, there are four signaling bits per DS0 Channel (A/B/C/D). The screen provides several combinations. For example, A1/B1 means A and B bits for receiver 1, while C2/D2 means C and D bits for receiver #2. If ESF is present, use NXT softkey to scroll through four screen combinations:

- | | | | |
|----------|----------|----------|----------|
| 1) A1/B1 | 2) C1/D1 | 3) A1/B1 | 4) A2/B2 |
| A2/B2 | C2/D2 | C1/D1 | C2/D2 |

NOTES:

This display provides a convenient check of the activity on all 24 trunks simultaneously in both directions. When a trunk is seized, it goes off-hook and this causes a wink in the opposite direction. This is normally followed by answer supervision, which is an off-hook from the same direction as the wink. When the call is completed, a disconnect signal, which is an on-hook, is sent from either end. To release the trunk, normally both parties need to be on-hook again.

To capture telephone numbers:

12. Depress the DS0 SIG key to display screen below, use the < and > softkeys (F3 and F4) to underline DIGIT(MF) :

BITS CALL(MF) DIGIT WINK SS7
 RCVR: #1 CNFG < > ENTR

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13. Depress the RCVR:# softkey (F1) to select the receiver that will capture the phone numbers.

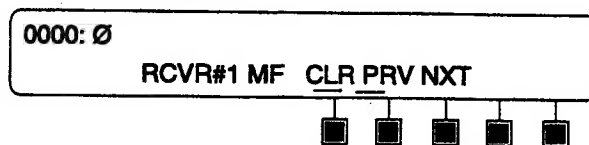
NOTE: To verify or modify the configuration of the signaling supervision states, see step 39 on page 11/20, Editing Call capture.

14. Depress ENTR softkey (F5). The screen reads:

DIGIT-CAPTURE TYPE: MF DTMF CUT-THRU
 DP

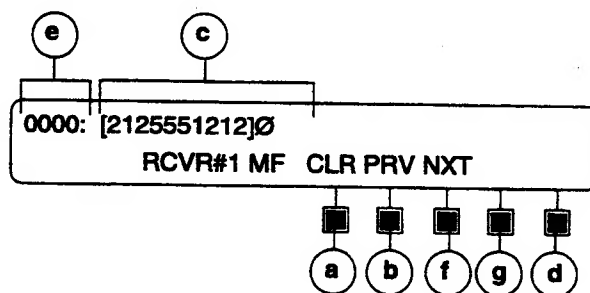
☐ ☐ ☐ ☐ ☐

15. Use the <> softkeys (F3 and F4) to move the underline to MF, DTMF, CUT-THRU, or DP (dial pulse) depending on the type of signaling used. (CUT-THRU will capture MF and DTMF digits, if they are separated by an STP symbol.)
16. Depress NXT softkey (F5). The screen reads:



NOTE: This screen displays telephone numbers as they are captured. There is no telephone number currently shown in this screen, only an index number appears. As digits are captured, they will appear across the top line of the screen, after the 0000: index. If more than thirty-five digits are captured, they will roll to the next screen, and can be viewed by using the NXT softkey (F5). To clear all digits from memory, press the CLR softkey (F3). The index number identifies the position of the last digit on the previous screen (i.e. on the following screen, the index number will be 0035: indicating that the next digit displayed is the 36th digit captured. Up to 35 digits can be viewed per screen, and up to 4900 digits and symbols can be captured).

17. Description of telephone number screen:



- Select the receiver to be used for capturing digits (#1 or #2) with the F1 softkey
- MF indicates the type of digits expected, toggle between DTMF and MF with the F2 softkey
- The telephone numbers, ON/OFF hook, and KP/ST symbols are captured and displayed automatically.
- Use NXT to scroll through pages of digits, or
- Enter a reference index number with the keypad to jump to a specific screen
- Use CLR softkey to clear/erase all stored digits
- Use PRV to scroll backwards to previous screens.

Symbol key for Telephone No screens

↓ = On Hook	= = ST2P
↑ = Off Hook	≡ = ST3P
[= KP	F = flash (an improper wink)
] = ST	G = glitch (sporadic A/B state change)
- = STP	

To scan channels and capture call details (Option 07 Auto-Scan/Call analysis):

18. Press the SIG key to display the main screen below. Use the < > softkeys (F3, F4) to underline CALL (MF) and press GO (F5) to start the auto-scan/call analysis. (GO will become a flashing STOP):

BITS CALL(MF) DIGIT WINK SS7
 <SCAN: 0> EDIT VIEW < > STOP



NOTE: To edit Call Capture (use EDIT) refer to step 39 on page 11, Editing Call Capture.

19. As soon a call is captured, <SCAN: 1> indicates 1 call received. To view the call details (while in the process of capturing additional calls) depress the VIEW softkey (F2). A typical screen reads:

CALL#001: [6509653415]ØT
 (MF) EXIT PRNT CLR PRV NXT



20. Depress the NXT softkey (F5) to display the wink details:

CALL#001: DELAY DURATION
 WINK#1 300ms 220ms PRV NXT



21. Depress the NXT softkey (F5) to display the call origination details:

22. Depress the NXT softkey (F5) to display the call termination details:

Origination

CALL#001: ORIGINATED BY RCVR#1, CH#6
 OFF-HOOK() AT <13:35:56> PRV NXT



Termination

CALL#001: TERMINATED BY RCVR#1
 ON-HOOK(Ø) AT <13:39:01> PRV NXT



23. Depress the NXT softkey (F5) to display the trunk release details:

CALL#001: CIRCUIT RELEASED BY RCVR#2
 TIME: 10 secs PRV NXT



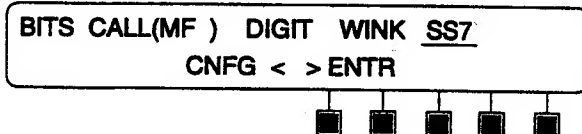
NOTE: Trunk release time is the interval between the call termination and the last on-hook received, which restores the trunk to an idle state. If no answer was received, a "CIRCUIT NOT YET RELEASED" message will be displayed until the Auto-Scan Time-Out period expires, at which time, a "RCVR # NEVER WENT OFF-HOOK" will be displayed.

Wink Timing

Measuring wink timing

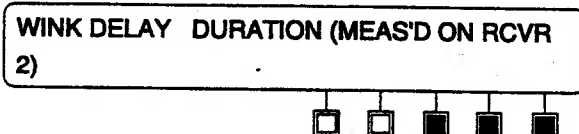
Wink timing measurements can only be measured by Receiver #2. Therefore, seizure must be recognized on Receiver #1 (Figure A) or generated by Transmitter #1 when sending telephone numbers (Figure B). The response wink must be captured by Receiver #2.

24. Press the SIG key to display the main menu screen below, as shown in steps 10 and 15. (If this screen is not displayed press SIG a second time.)

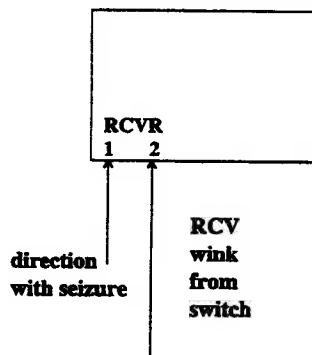


NOTE: To verify the test setup and to configure signaling supervision parameters refer to step 30 on page 10.

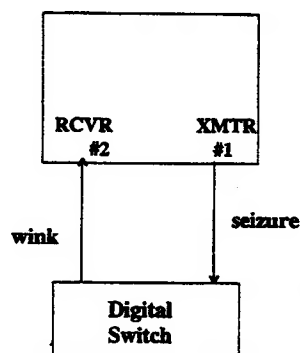
26. Press the ENTR softkey (F5) to display the wink measurement screen:



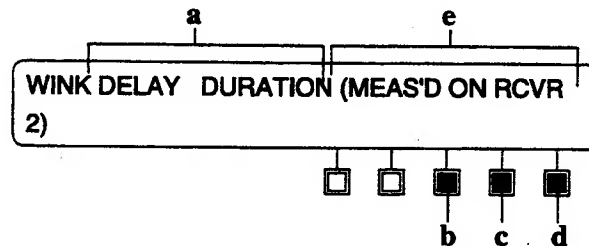
A. Monitoring both T1 directions



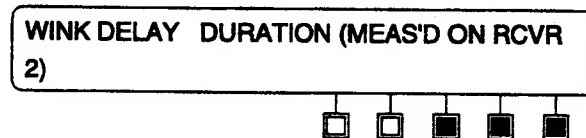
B. Test set generates seizure (XMTR #1)



27. Interpreting Wink measurement screen:

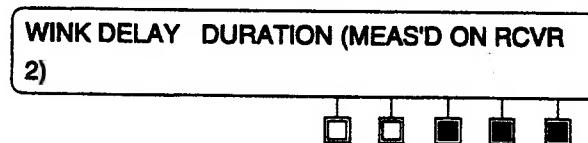


- a) Duration and delay are captured and displayed automatically. The Delay (Guard Time) shows 200 ms, while the wink Duration shows 350 ms. (0 ms indicates that the test is set-up and waiting for the wink.)
- b) Use NXT to scroll through 2 additional wink results
- c) Clear results and begin new test by pressing GO
- d) Return to main signaling screen with EXIT
- e) Notice the reminder that only Receiver #2 can measure wink, therefore set up patchcords accordingly.



NOTE: Once telephone number capture and wink tests are set-up, the 440B will automatically proceed with measurements even if the screens are not displayed. In other words, after being configured, the unit can capture telephone numbers and measure winks, even while displaying a completely unrelated screen (for example DS1 SUMMARY). Results can be displayed simply by returning to the desired tests.

- 28. Press NXT to scroll through additional results until the WINK measurement/results screen shown below is displayed. The results captured in the screen below indicate a 350 ms wink duration and a 200 ms delay (guard time).
- 29. Press GO softkey (F4) to clear previous wink measurements and begin new wink tests.



Configuring supervision states for Telephone Number capture and Wink measurement

30. Use the following screens To verify or change signaling or wink supervision states.
31. Press the SIG key to display the root signaling screen. (If this screen is not displayed press SIG a second time) (For location of the SIG key refer to the drawing on page 6/21)

BITS CALL(MF)	DIGIT	WINK	<u>SS7</u>
CNFG < > ENTR			

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32. A series of configuration screens are provided for customized test settings. Press CNFG to access the following configuration screens.

DSO SIGNALLING FORMAT:			
ROBBED BIT	CLEAR CHAN	< >	NXT

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33. When CLEAR CHAN is selected, the 440B ignores the signaling bit states, and therefore does not recognize On/Off Hook states or Flash Hooks and intermittent signaling state changes.

When Robbed Bit is selected, the 440B captures and displays On/Off Hook status, as well as intermittent state changes.

34. In the screen above press NXT to display the on/off hook definition screen shown below. Use < > softkeys and keypad entry (1/0), to select A/B signaling bit transitions for Off Hook (↑) and On Hook (↓).

In the screen below, the ON to OFF hook transition is defined as A=0 to A=1.

SWITCH-HOOK AB AB			
STATES	:0* 0:1*	< >	NXT

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35. The 440B can simultaneously capture telephone numbers and measure wink.

When testing a live system, RCVR #1 must receive the originating seizure, while RCVR #2 receives the wink response and measures wink timing (Figure A).

When using the 440B XMTR #1 to seize the circuit and dial out, RCVR #2 will receive the wink response (Figure B on pg 8) and measure wink timing.

Press NXT

SEIZURE ON: <u>RCVR#1</u> XMTR#1			
(WINK IS MEASURED ON RCVR#2) < > NXT			

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36. Underline your choice in the screen above and press NXT to display the Seizure Code definition screen below. Use the < > softkeys and keypad to enter 0/1 states.

SEIZURE	AB
CODE	1* _ < > NXT

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37. Press NXT to display the Wink Code definition screen below. Use the < > softkeys and keypad to enter values.

WINK	AB
CODE	1* _ < > NXT

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38. Press NXT to return to the root signaling screen.

BITS	CALL(MF)	DIGIT	WINK	SS7
	CNFG	< >	ENTR	

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Editing Call Capture

39. Press the SIG key to display the root signaling screen and use the < > softkeys (F3,F4) to underline CALL(MF). (If this screen is not displayed press SIG a second time)(For location of the SIG key refer to the drawing on page 6/21)

BITS	<u>CALL(DTMF)</u>	DIGIT	WINK	SS7
	EDIT	VIEW	< >	GO

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40. Press EDIT

1. DIGIT TYPE: MF DTMF CUT-THRU(C/T) DP
< > NXT

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41. Use the < > softkeys (F3,F4) to underline MF to capture digits on E&M interoffice trunks.

NOTE: This selection allows the capture of MF, DTMF, C/T, or DP calls. C/T consists of MF and DTMF separated by an STP.

42. Press NXT and use the < > softkeys (F3,F4) to move the underline to SELECT to display the channels selected for scanning:

2. SCAN CHANNELS: <u>SELECT</u> SINGLE
123456789 ¹ 0123456789 ² 01234 EDIT < > NXT

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NOTE: This screen also allows for the selection of single trunk monitoring.

43. Depress the EDIT softkey (F2) to change the channels selected. The screen reads:

SELECT CHANNELS: CH: 01
11111111111111111111111111111111 ALL < > NXT



44. Use the < > softkeys (F3,F4) to move the underline to the channel(s) desired. Using the keypad, press 1 to select and 0 to delete a channel.
45. When the channels to be scanned have been selected, press NXT softkey (F5) and use the keypad to set the Auto-Scan Time-Out interval (from 1 to 60 seconds):

3. AUTO SCAN TIME-OUT: 15
(ENTER 1-60 W/KEYPAD) < > ENTR



NOTE: This interval sets the amount of time that is spent monitoring a particular channel before moving to the next channel.

46. Press ENTR softkey (F5) and then YES (softkey F1) to select wink measurement and display:

4. MEASURE WINKS: YES
(MEASURED ON RCVR#2) NO YES < > NXT



NOTE: Wink is always measured on RCVR#2; verify the correct placement of patch cords so that this is the case.

47. Press the NXT softkey (F5) and then YES softkey (F2) to capture and analyze call disconnect details:

5. DISPLAY DISCONNECT ANALYSIS: YES
NO YES < > NXT



NOTE: This screen allows call details to be captured and reported. The details include:

- Direction, time, and channel for call origination
- Direction, time, and channel for call termination
- If answer was received, direction and release time

48. Press NXT softkey (F5) and verify that the screen reads as follows, if not change accordingly:

6. ON/OFF HOOK AB AB
(Ø=ON =OFF) Ø:0* :1* < > NXT



NOTE: This screen allows the off hook condition to be set for either a 1 (normal case) or 0, and vice-versa for the on hook condition. It also allows either the A or B bit to be monitored for on/off hook conditions.

49. Press NXT softkey (F5) and verify that the screen reads as follows, If not change accordingly:

7. SEIZURE ABCD

1*** ≤ > NXT

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NOTE: This screen allows the seizure condition to be set for a 1 (normal case) or 0. It also allows either the A or B bit to be monitored for the seizure condition.

50. Press NXT softkey (F5) and verify that the screen reads as follows, if not change accordingly:

8. WINK CODE ABCD

1*** < > NXT

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NOTE: This screen allows the wink condition to be set for a 1 (normal case) or a 0. It also allows either the A or B bit to be monitored for the wink condition.

51. Press NXT to return to the root signal screen.

SS7 Monitoring (Option 14)

When equipped with Option 14, the 440B/T-ACE can independently monitor two SS7 channels (56Kb/s or 64Kb/s), non-intrusively, from DS1 monitor jacks. An SS7 circuit can also be tested from a DS3 bitstream when the 440B is equipped with the 52B+ or 52C. An SS7 circuit can also be tested at DS0-DP/OCU-DP access points when the 440B is equipped with Option 30 (DS0 Data access).

SS7 errors automatically trigger the flashing HISTORY indicators, and the message "SS7 Errors Detected" appears in the main SUMMARY screen. Since SS7 monitoring occurs in "background" mode, DS1 and DS3 facility errors will continue to be captured automatically. This allows easy isolation of facility troubles from pure SS7 equipment failures. DS0 VF and signaling measurements can also be made on other channels while an SS7 channel is being monitored.

This option provides individual error counts, as well as packet/traffic statistics including total packet counts by type, and % MSUs, LSSUs, FISUs.

Option 14 also provides limited SS7 packet transmit simulation using the dual transmitters in terminal or DS0 Drop-and-Insert mode. This may be useful to verify receive functions before system/equipment turn-up. (For packet transmit functions, refer to Hint Card 15.)

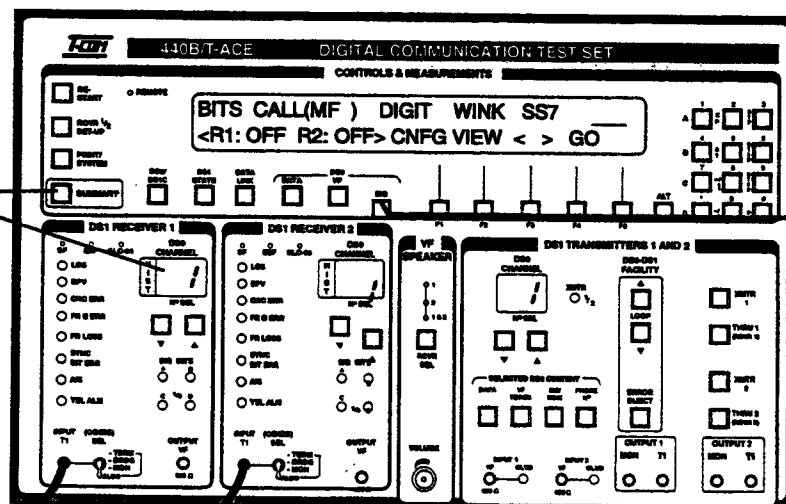
NOTE: The unit's Split Mode capability allows using one receiver for SS7 testing while using the other for unrelated T1, Fractional T1, or DS0A/B BERT or monitoring.

Set-Up

1. Patch DS1 circuit(s) into Receivers 1 and 2. Set the toggle switches to MON. All error/alarm LEDs should be off.
2. Depress the SIG key and underline SS7:

BITS CALL(MF) DIGIT WINK SS7
<R1: OFF R2: OFF> CNFG VIEW < > GO

NOTE: SS7 errors will automatically trigger the flashing channel/error indicators, and "SS7 Errors Detected" will appear in the main SUMMARY screen. Therefore, once SS7 is started, it is not necessary to use steps 7-11 to determine errors have occurred.



SS7 Monitoring (Option 14)

15/20

3. Depress the CNFG key (F1) and use the arrow softkeys (F1 thru F4) to select the SS7 channel (#24 in this example) to be monitored by each receiver:

1. DS0 CHANNEL RCV1: 24 RCV2: 24
Ø Ø NXT



NOTE: Between 1 and 24 there is an "OFF" selection which turns off the SS7 monitoring associated with a particular receiver.

4. Depress NXT and depress F1/2 (and F3/4) to select either 56 or 64 kbps operation for the SS7 channel for Receiver 1 (and 2):

2. DS0 RATE RCV 1 RCV 2
56K 56K NXT



5. Depress NXT and depress F2 to select either YES or NO:

3. LOCK DS0 CHANNEL SELECTION TO
FRONT PANEL CONTROLS: NO NXT



Note: The above selection (NO) allows the independent operation of the front panel channel selectors, so that they may be used for VF or SIGNALING measurements while SS7 is being monitored in the background on the previously selected channel (#24 in this example). Depress NXT to return to screen #1.

Starting SS7 Monitoring

6. Depress the DS0 SIG key to return to the main menu screen of Step 1 and depress GO to start monitoring the selected SS7 channel(s):

BITS CALL(MF) DIGIT WINK SS7
<R1:CH#24 R2:CH#24> CNFG VIEW < > GO



Note: If SS7 is not present on the selected channel(s), "N/A" will appear in the screen above instead of CH#24. GO is now a flashing STOP. Depress STOP (F5) to stop monitoring the SS7 channel(s).

7. While monitoring the SS7 channel(s), depress VIEW (F2):

RCVR1: SS7 SUMMARY
ALL RESULTS OK RCV2 MORE



Note: This screen is similar to the DS1 SUMMARY screen, except that only SS7 errors are displayed. Depress F4 to display the RCVR 2 SS7 SUMMARY, if desired. (Use MORE, then ENTR, then NXT to scroll through the different errors.)

SS7 Monitoring (Option 14)

Viewing all error counters and packet statistics.

8. Depress MORE (from screen in step 7):

<u>ERROR COUNTS</u>	STATISTICS
EXIT < > ENTR	

Note: This screen permits the user to select two display modes:

- a. Error Counts (cumulative SS7 error counts)
- b. Statistics (data packet analysis)

9. With ERROR COUNTS underlined, depress ENTR:

[<u>ERR COUNTS</u>]	RCVR1	RCVR2
0	0	NXT

Note: By depressing NXT, the following error counts can be accessed for RCVR 1 and 2:

- | | |
|-----------------------------|-----------------------------|
| a. Cyclic Redundancy Check | f. SYNC-LOSS EVENTS |
| b. LENGTH Indicator | g. Processor/OUTAGE Seconds |
| c. Negative Acknowledgments | h. Processor/OUTAGE EVENTS |
| d. RETRANSMITS | i. Processor/BUSY Seconds |
| e. SYNC-LOSS Seconds | j. Processor/BUSY EVENTS |

10. Depress the DS0 SIG key, the VIEW softkey, and the MORE softkey. Move the underline to STATISTICS:

ERROR COUNTS	<u>STATISTICS</u>
EXIT < > ENTR	

11. Depress ENTR:

[<u>STATISTICS</u>]	RCVR1	RCVR2
% MSUs	0.00	0.00
		NXT

Note: By depressing NXT, the following statistics can be accessed for RCVR 1 and 2:

- a. % Message Signaling Units
- b. % Link Status Signaling Units
- c. % Fill In Signaling Units
- d. Total Packets (PKTS)
- e. Total Message Signaling Units
- f. Total Link Status Signaling Units
- g. Total Fill In Signaling Uni

37. Press NXT to return to the menu screen:

DS0 STATISTICS				
BITS CNT SEC BER				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Errored Seconds events

38. Press SEC to display:

SYNC LOSS SECONDS (requires test pattern)

RCVR 1	PRI-2047	SEC-LIVE	SEL	
SYNC LOSS-SECS	0	N/A	NXT	#2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Press NXT to scroll through the following screens:

FRAME LOSS SECONDS

RCVR 1	PRI-2047	SEC-LIVE	SEL	
FR LOSS-SECS	0	N/A	NXT	#2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

BLOCK ERRORS

RCVR 1	PRI-2047	SEC-LIVE	SEL	
BLOCK ERRS	0	N/A	NXT	#2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Press NXT to return to the main menu screen:

DS0 STATISTICS				
BITS CNT SEC BER				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Bit Error Rate Measurements

39. Press BER to display:

Logic Bit Error Rate (requires test pattern)

RCVR 1	PRI-2047	SEC-LIVE	SEL	
BER	5.2 x 10	N/A	NXT	#2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Press NXT to display the following screens:

Majority Vote Bit Error Rate

RCVR 1	SEL			
MAJ VOTE BER	LOW ERROR	NXT #2		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(Use softkey F5 to toggle between RCVR 1 and RCVR 2)

DS0 Frame Bit Error Rate

RCVR 1	SEL			
DS0 FRAME BER	LOW ERROR	NXT #2		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(Use softkey F5 to toggle between RCVR 1 and RCVR 2)

Press NXT to return to the main menu screen:

DS0 STATISTICS				
BITS CNT SEC BER				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Press BITS to return to the 8 bit word display:

RCVR 1 DS0 BITS: 12345678	SEL			
DSU LOOP	<input checked="" type="checkbox"/> NXT #2			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>